

U.S. Patent Application Serial No. 10/527,699
Amendment filed April 12, 2007
Reply to OA dated December 15, 2006

REMARKS

Claims 1-20 are pending in this application. No amendment is made herein. The Applicant respectfully submits that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated **December 15, 2006**.

Claims 1-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Pittman, Jr. et al., USP 4,258,206 (hereafter referred to as Pittman), Zoeller et al., USP 6,452,043 (hereafter referred to as Zoeller), Corain et al., *J. Mol. Catal. A: Chemical*, vol. 173 (2001), pp. 99-115 (hereafter referred to as Kralik) and *Reactive Polymers*, vol. 15 (1991) pp. 135-145 (hereafter referred to as Toshima). (Office action paragraph no. 2)

Applicant respectfully notes that Zoeller et al. (patent date September 17, 2002) is not prior art under 35 U.S.C. 102(b) for the present application (international filing date September 1, 2003), and Applicant will consider it prior art under 35 U.S.C. 102(e).

The rejection of claims 1-20 is respectfully traversed, and reconsideration is requested.

In the rejection, the Examiner notes that the patentability of a product-by-process claim is based on the product, not on the process. The Examiner additionally provides a Response to Arguments in paragraph no. 3 of the Office action, stating: "Applicant has merely added product-by-process limitations in the claims."

This refers to the Amendment of September 1, 2006, where Applicant amended claim 1 to add the product-by-process limitations of the steps of "homogenizing," "depositing," and "subjecting to crosslinking ..." Applicant argued (page 19 of that Amendment) that this product-by-process limitation defined a specific structure that is recited in claim 1 as the catalyst being "physically carried on the crosslinked organic polymer." In particular, Applicant pointed out how the process limitations lead to a network structure that fixes the palladium catalyst.

Applicant therefore maintains the argument that the product-by-process limitations inherently define a **structural** limitation that is not met by the prior art. In this regard, Applicant notes the Examiner's statement that Applicant "**merely** added product-by-process limitations" (emphasis added). A product-by-process limitation is a proper way to claim a structure that is not easily defined, and the word "merely" is inappropriately applied.

Applicant submits that the present rejection is, in effect, an "inherency" rejection, in which the Examiner is implying that the prior art inherently has the same structure as recited in claim 1. With regard to inherency, MPEP 2112 states, in part:

"The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993)(reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981).

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original) ..."

However, Applicant submits that the Examiner has **not** provided the required "basis in fact and/or technical reasoning" to support the rejection, and therefore has not provided a proper anticipation rejection.

Moreover, Applicant submits that the structural differences between the present claims and the cited references can be readily seen from the disclosures of the references.

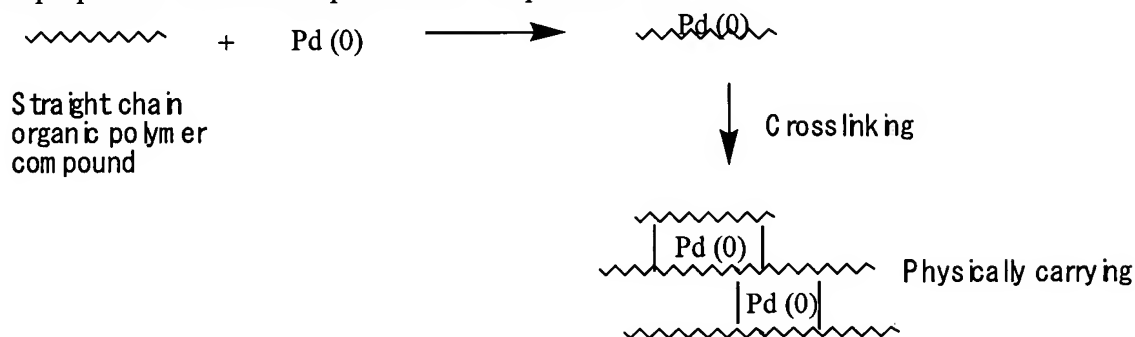
In particular, the composition of the present invention is different from that of the references in the mode by which palladium is carried. The modes of carrying palladium in respective compositions are shown in the following table.

| | Mode of Carrying Palladium | Carrier |
|-----------------------|--|---|
| The present invention | Physically carrying by carrying a palladium catalyst on a straight chain organic polymer compound having a crosslinkable functional group, then subjecting it to a crosslinking reaction | The polymer obtained by closslinking a straight chain organic polymer. |
| Pittman | Coordinate linkage | Lightly crosslinked matrix which is swellable by solvents |
| Zoeller | Ion bond or adsorption | Carbonized polysulfonated divibylbenzene-styrene polymers or copolymers having multimodal pore size |
| Kralik | Carrying palladium by interaction of functional groups such as $-SO_3H$, $-OH$, $-NR_3$ | Functional resin |
| Toshima | Carrying palladium by chelate effect | Chelate resin (CR-Na or CR-Mg) |

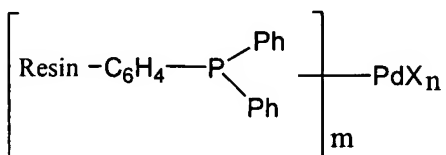
The differences in structure of the present claims and the structures disclosed in the references can be clearly seen from the given structures or by inferring the structures resulting from the methods used to make the compositions. The composition of the present invention is obtained, as shown in the following figure, by carrying a palladium catalyst on a straight chain organic polymer compound having a crosslinkable functional group, then subjecting it to a

crosslinking reaction. In the resulting structure, the palladium is physically carried on the composition.

The preparation of the composition of the present invention



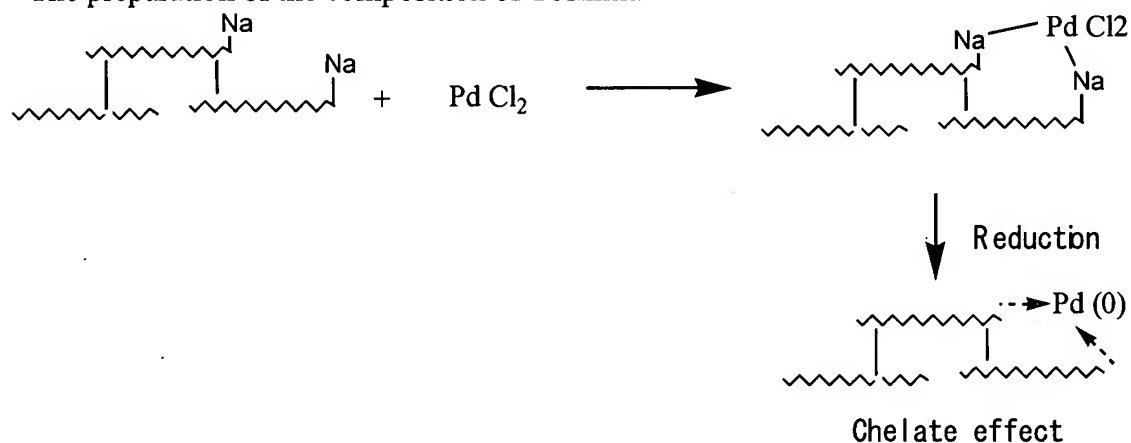
In Pittman, as is clear from the following general formula, which is disclosed in column 7 of Pittman, palladium is carried on the phosphine of the carrier by the coordinate linkage. This structure is clearly different from the “physically carrying” structure (shown above) of the present claims.



In the composition of Zoeller, palladium is carried on carbonized polysulfonated divibylbenzene-styrene polymers or copolymers having multimodal pore size by ion bond or adsorption. Thus, the resulting structure in Zoeller is therefore also different from that of the present invention.

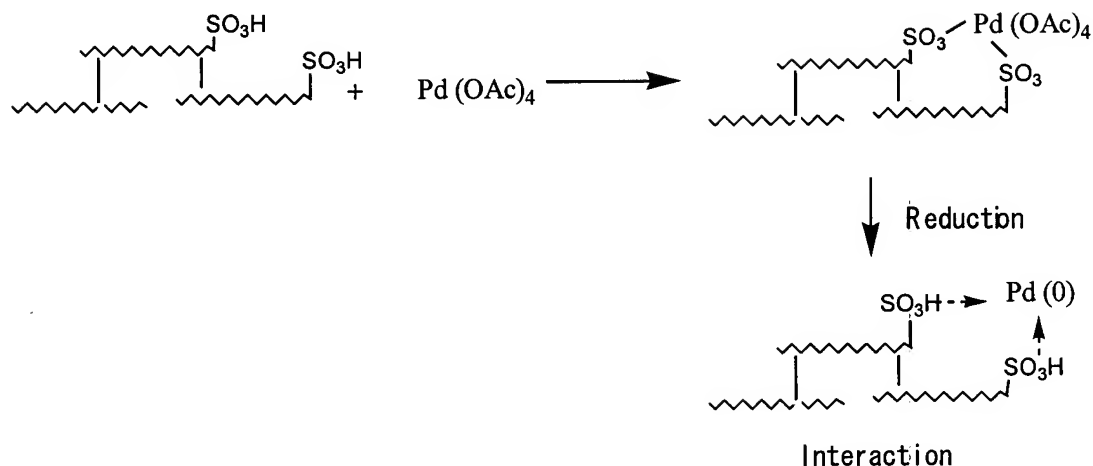
In Toshima, Na^+ or Mg^{2+} in the chelate resin-metal complexes is bonded to palladium ions by ion bond, then palladium ions supported on the resin complexes are reduced to support (carry) the palladium on the chelate resin. As shown in the following formula, palladium after reduction, $\text{Pd}(0)$, is carried by the chelate effect in Toshima. Thus, palladium is not physically carried on the composition in Toshima. The structure by which palladium is carried is clearly different from that of the present claims.

The preparation of the composition of Toshima

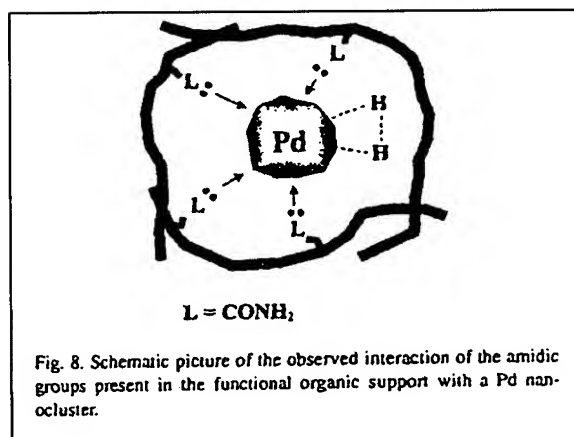


In Kralik, palladium is carried on a functional resin by reacting the functional resin possessing an acidic $-\text{OH}$ group with a palladium salt or the functional resin possessing $-\text{NR}_3$ group with $[\text{PdCl}_4]^{2-}$, then reducing the palladium ion to carry the palladium on the functional resin (see the following figure).

The preparation of the composition of Kralik



As shown in Fig. 8 on page 113 in Kralik (reproduced below), the palladium after reduction, Pd(0), is carried by the interaction of functional group such as an amide group in the resin, and is not physically carried, unlike the present invention. Thus, the mode of carrying palladium in Kralik is clearly different from that of the present claims.



As mentioned above, the catalyst composition of the present invention is different from the palladium catalyst compositions of the references in the mode of carrying palladium. Applicant notes that the catalyst composition of the present invention gives stronger physical carrying palladium than the cited references.

Applicant further submits that there is no suggestion in the cited references for the composition of the present claims. Moreover, the composition of the present claims has unexpected results over the prior art. Since palladium is strongly and physically carried in the catalyst composition of the present invention, it can be handled safely and easily without danger of spontaneous ignition and is very useful as a catalyst for various reactions and also has advantage that it keeps its activity even in repeated use and a metal catalyst does not leak from its polymer compound carrier. Further, though it has been said that a heterogeneous catalyst such as a catalyst composition of the present invention generally has lower activity, a catalyst composition of the present invention has a surprising effect of rather higher catalyst activity than a conventional catalyst (lines 4-19 on page 50 in the present specification). The references do not suggest or teach such effects of the present invention. Thus, the effect of the present invention cannot be expected from the references.

Applicant therefore submits that claims 1-20 are not anticipated by Pittman, Zoeller, Kralik or Toshima, and further, are not obvious over these references.


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If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the Applicant's undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the Applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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